Reg. No. : | | | | | | | | | | |

Question Paper Code: 93304

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electrical and Electronics Engineering

19UEE304 – ANALOG ELECTRONICS

(Regulation 2019)

Duration: One hour Maximum: 30Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The number of pn junctions in a BJT is/are CO1- R

   (a) 1 (b) 2 (c) 3 (d) 4

2. Which of the following is true for the saturation region? CO1- R

   (a) VDG ≤ |Vtp| (b) VSD ≤| VOV| (c) VDG < |Vtp| (d) VSD <| VOV|

3. In CE configuration, if the voltage drop across 5kΩ resistor connected in the collector circuit is 5V. Find the value of IB when β=50. CO2-R

   (a) 0.01mA (b) 0.25mA (c) 0.03mA (d) 0.02mA

4. The correct expression relating the emitter current Ie to the collector current Ic is CO2-R

   (a) Ie = α Ic (b) Ic = α Ic (c) Ie = ß Ic (d) Ic = ß Ic

5. The expression for the differentiator time constant is CO4- U

   (a) CR (b) 1/CR (c) R/C (d) C/R

6. What are the units of slew rate? CO4- R

   (a) Second/Volt (b) Volt/second (c) It is a ratio, no units (d) Ohm/second

7. Calculate the frequency of oscillation for RC phase shift oscillator having the value of R and C as 35Ω and 3.7μF respectively. CO4- U

   (a) 1230 Hz (b) 204 Hz (c) 502Hz (d) 673 Hz

8. What is Barkhausen criterion for oscillation? CO4- R

   (a) Aß > 1 (b) Aß < 1 (c) Aß = 1 (d) Aß ≠ 1

9. A monostable multivibrator has R = 120kΩ and the time delay T = 1000ms, calculate the value of C? CO5- U

   (a) 0.9μF (b) 1.32 μF (c) 7.5 μF (d) 2.49μF

10. Free running frequency of Astable multivibrator? CO5- R

(a) $f=1.45/(R_A+2R_B)C$ (b) $f=1.45(R_A+2R_B)C$

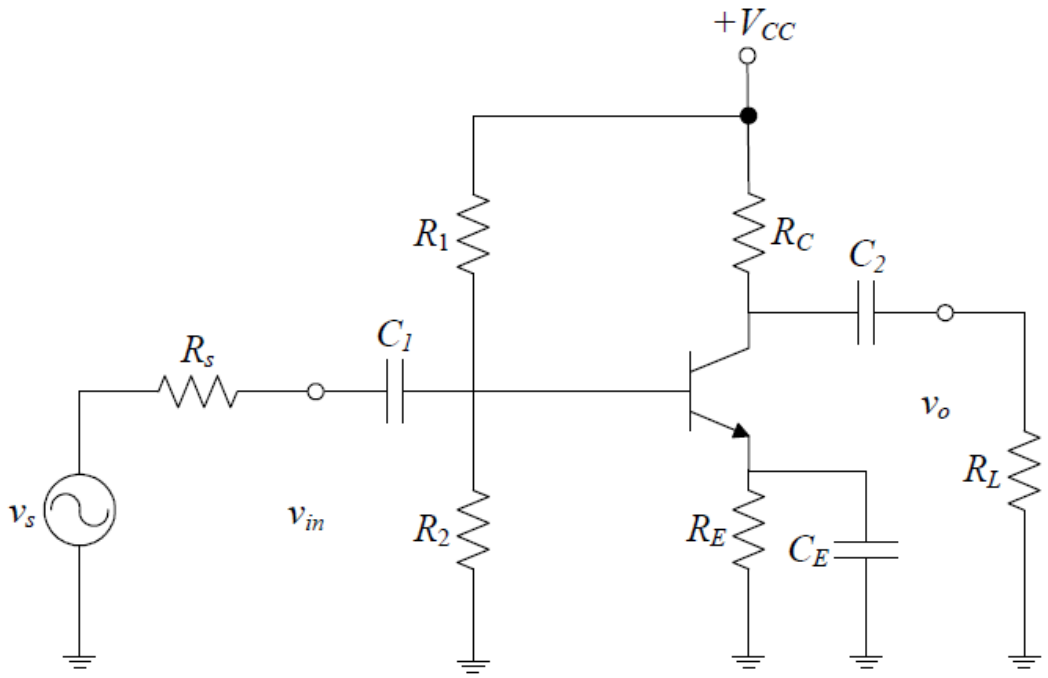
(c) $f=1.45C/(R_A+2R_B)$ (d) $f=1.45\ R_A/(\ R_A+R_B)$

PART – B (3 x 8= 24 Marks)

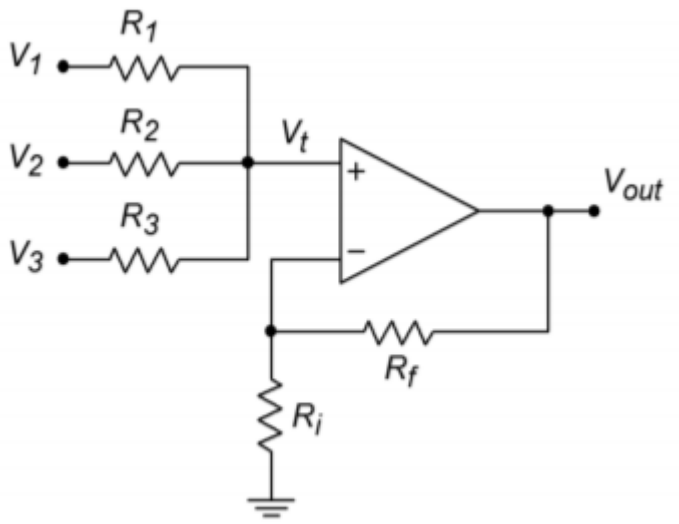
(Answer any three of the following questions)

11. Explain drain and transfer characteristic of JFET. CO1- U (8)

12. Consider the common-emitter BJT amplifier circuit shown in Figure. Assume VCC = 15 V, β = 150, VBE = 0.7 V, RE = 2.7 kΩ, RC = 4.7 kΩ, R1 = 47 kΩ, R2 = 10 kΩ, RL = 47 kΩ, Rs = 100 Ω. Determine the Q-point. CO2- App (8)



13. A non-inverting summer such as the one shown in figure below is used to combine three signals. V_1 = 1 V DC, V_2 = -0.2 V DC, and V_3 is a 2 V peak 100 Hz sine wave. Determine the output voltage if $R_1=R_2=R_3=R_f$ = 20 kΩ and Ri = 5 kΩ. CO3- App (8)



14. Design a square wave oscillator for f=1kHz. The op-amp is 741 with supply ±15V. CO4- App (8)
15. Design a symmetrical square waveform generator of 10kHz using 555 timer. CO5- C (8)